

ALBERI AVL - ESERCIZI

PIETRO DI LENA

DIPARTIMENTO DI INFORMATICA – SCIENZA E INGEGNERIA
UNIVERSITÀ DI BOLOGNA

ALGORITMI E STRUTTURE DI DATI
ANNO ACCADEMICO 2021/2022



ESERCIZIO 1

- Dato un albero AVL T con chiavi intere inizialmente vuoto, disegnare l'albero ottenuto dalle operazioni di inserimento in ordine delle seguenti chiavi:

1 INSERT(T , 50)

2 INSERT(T , 20)

3 INSERT(T , 10)

4 INSERT(T , 60)

5 INSERT(T , 40)

6 INSERT(T , 45)

ESERCIZIO 1 - SOLUZIONE

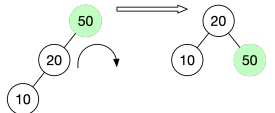
1. insert 50



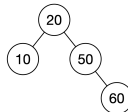
2. insert 20



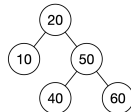
3. insert 10



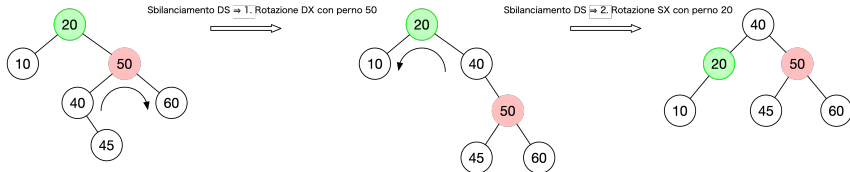
4. insert 60



5. insert 40



6. insert 45



ESERCIZIO 2

- Continuare con le seguenti operazioni (sull'albero precedente, mostrato sotto):

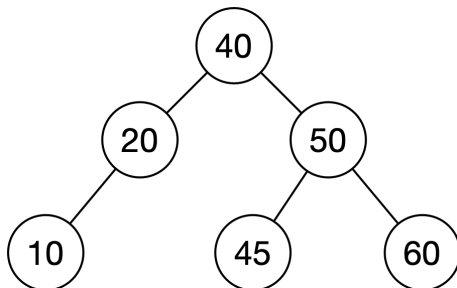
1 INSERT(T , 85)

2 INSERT(T , 55)

3 DELETE(T , 40)

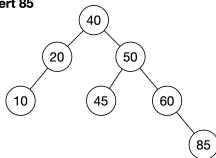
4 DELETE(T , 45)

5 INSERT(T , 15)

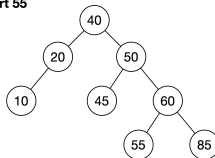


ESERCIZIO 2 - SOLUZIONE

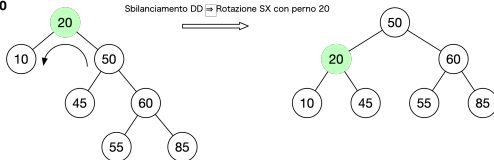
1. insert 85



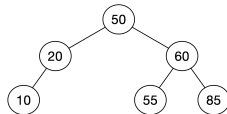
2. insert 55



3. delete 40

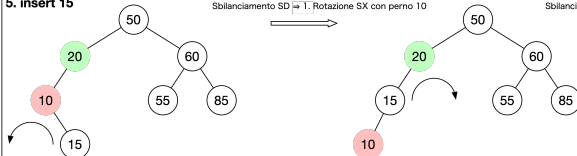


4. delete 45

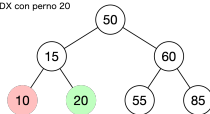


5. insert 15

Sbilanciamento SD \Rightarrow 1. Rotazione SX con perno 10



Sbilanciamento SD \Rightarrow 2. Rotazione DX con perno 20



ESERCIZIO 3

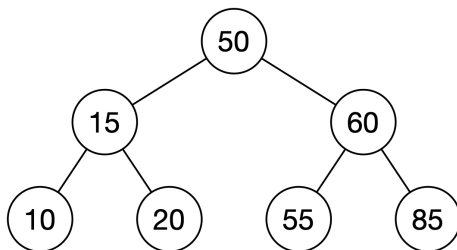
- Continuare con le seguenti operazioni (sull'albero precedente, mostrato sotto):

1 INSERT(T , 83)

2 DELETE(T , 55)

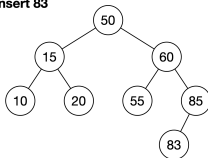
3 INSERT(T , 90)

4 DELETE(T , 60)

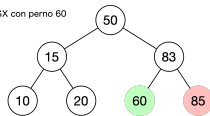
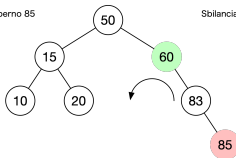
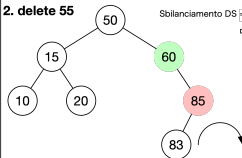


ESERCIZIO 3 - SOLUZIONE

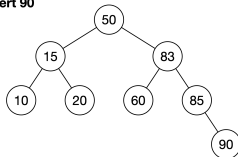
1. insert 83



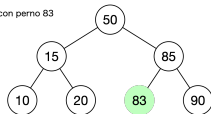
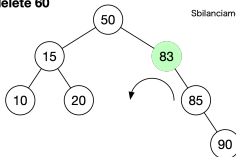
2. delete 55



3. insert 90



4. delete 60



ESERCIZIO 4

- Continuare con le seguenti operazioni (sull'albero precedente, mostrato sotto):

1 INSERT(T , 5)

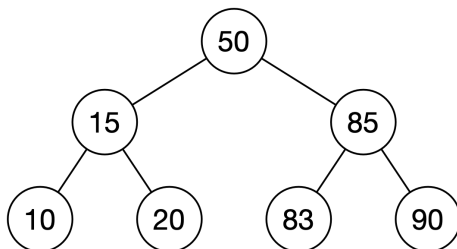
2 INSERT(T , 13)

3 INSERT(T , 17)

4 INSERT(T , 65)

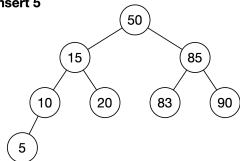
5 INSERT(T , 1)

6 DELETE(T , 90)

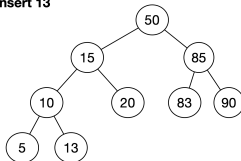


ESERCIZIO 4 - SOLUZIONE

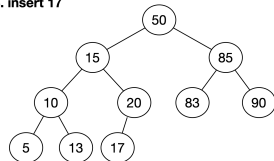
1. insert 5



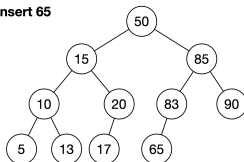
2. insert 13



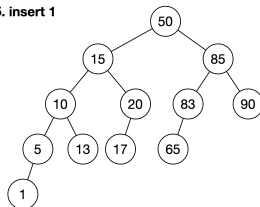
3. insert 17



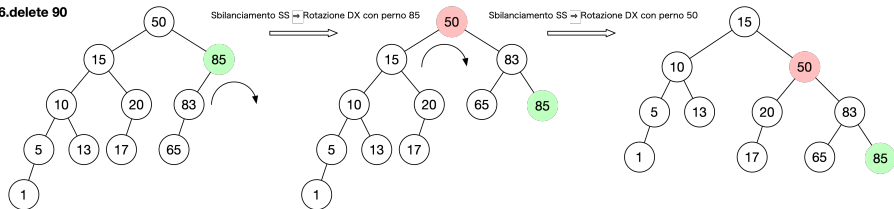
4. insert 65



5. insert 1



6. delete 90



ESERCIZIO 5

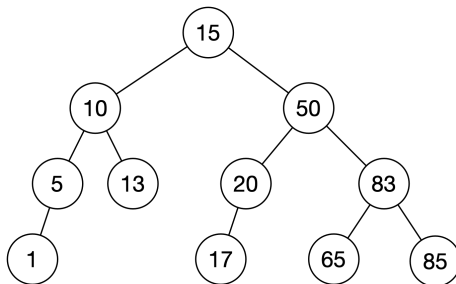
- Continuare con le seguenti operazioni (sull'albero precedente, mostrato sotto):

1 DELETE(T , 15)

2 DELETE(T , 13)

3 DELETE(T , 10)

4 DELETE(T , 50)



ESERCIZIO 5 - SOLUZIONE

